

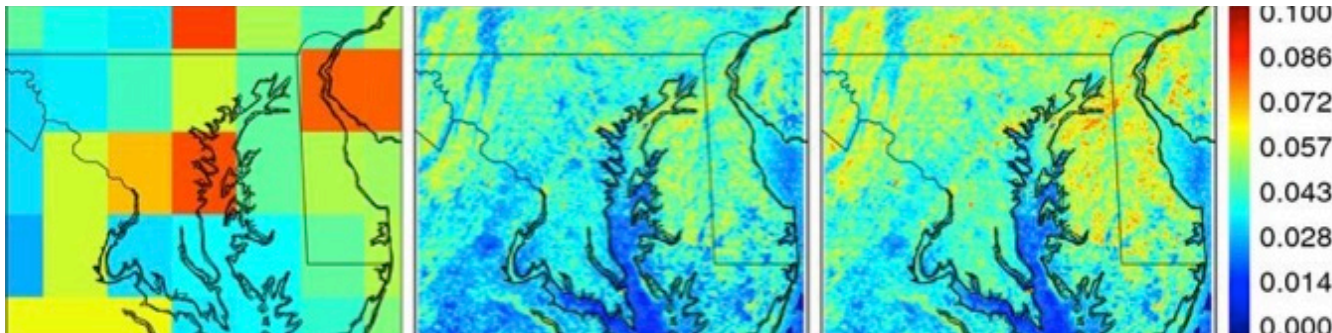
# Observations of NO<sub>2</sub> from OMI: Latest Product updates

- ▶ The Version 3.1 OMI NO<sub>2</sub> Standard Product (OMNO2):
  - New slant column density retrievals [Marchenko *et al.*, JGR , 2015]
  - 1° x 1.25° GMI monthly a priori NO<sub>2</sub> profiles with year specific emissions.
  - Use of alternative solar data (OML1BIR2)
  - KNMI cloud products (OMCLDO2) and improved surface pressure treatment
- ▶ The Version 4.0 OMNO2 uses a new OMI geometry-dependent LER (GLER):

OMI Climatological LER  
November (2005-2008)

MODIS-derived **GLER**  
November 13 2005

MODIS-derived **GLER**  
November 14 2005



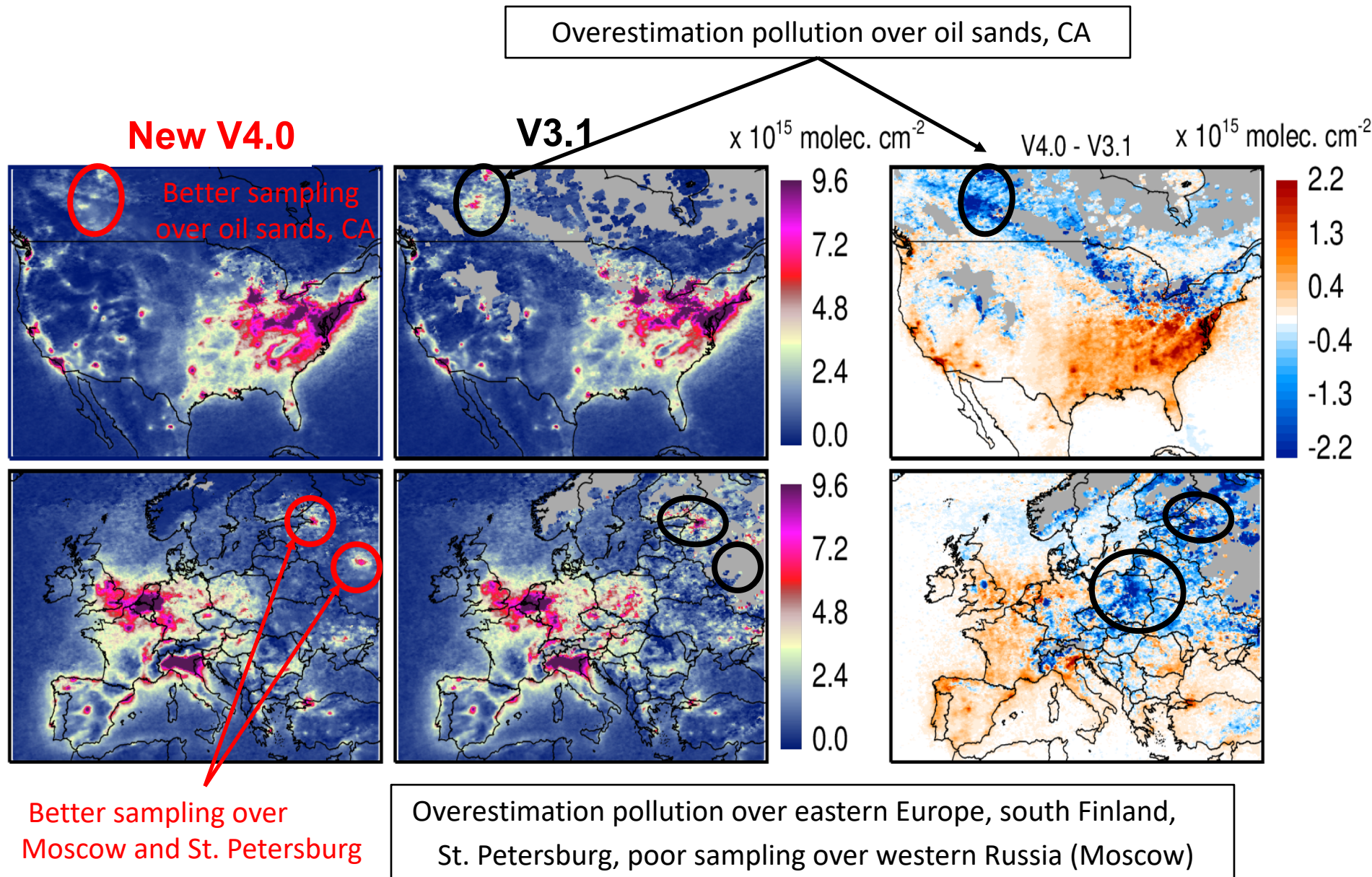
- 1km spatial resolution
- MODIS aerosol correction and BRDF
- Daily variation in OMI viewing geometry
- Seasonal variations
- Interannual variations due to land cover changes

- New OMI-core team developed O<sub>2</sub>-O<sub>2</sub> cloud products retrieved with GLER  
[Vasilkov *et al.*, AMT 2017,2018; Qin *et al.*, AMT 2019; Fasnacht *et al.*, AMT 2019]
- Improved NO<sub>2</sub>-Cloud retrievals and sampling over snow/ice surfaces
- Additional RA flagging (rows 44 and 45) after 2016

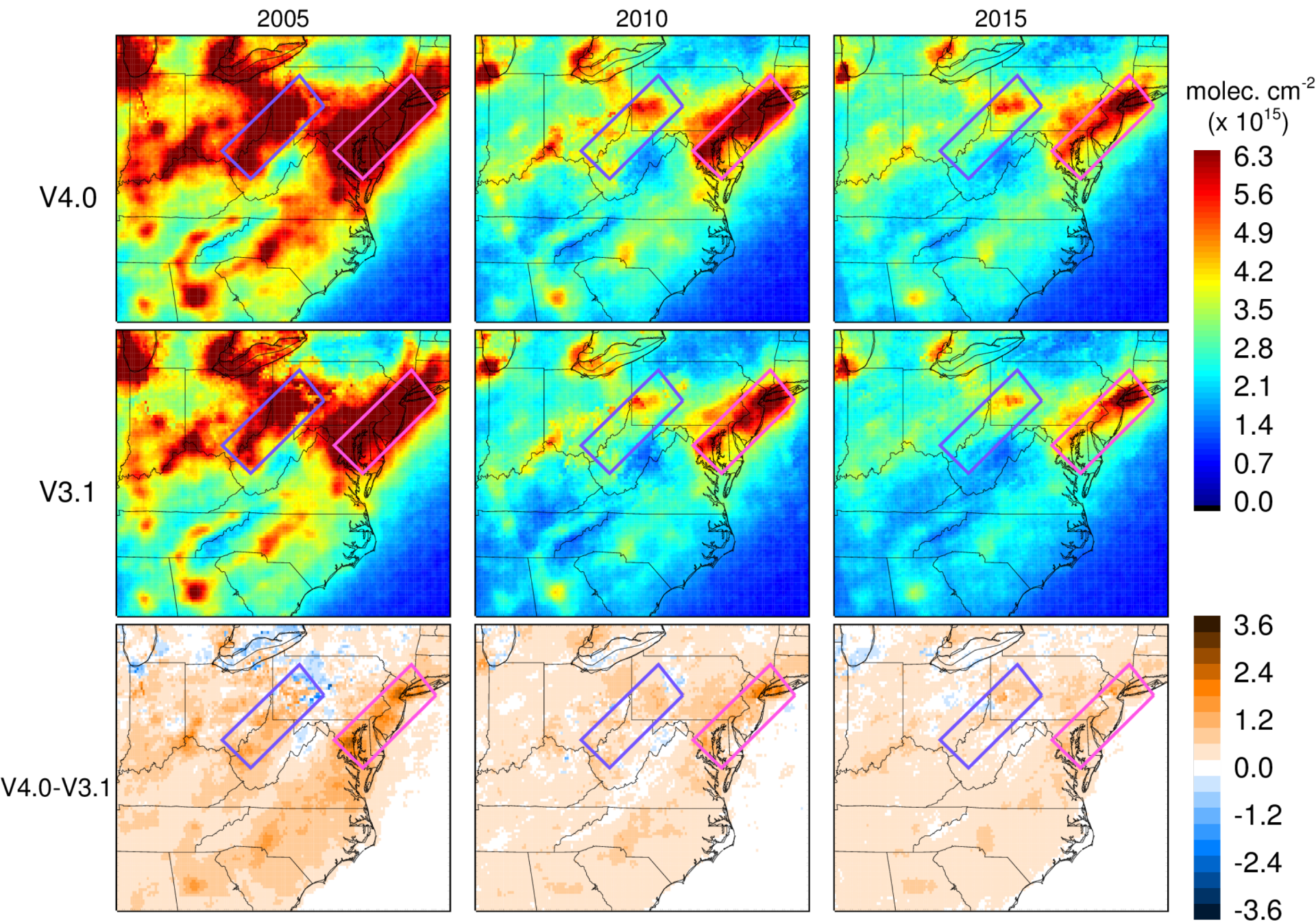
See GLER posters by Wenhan Qin and Zachary Fasnacht.

# V4.0 extends the NO<sub>2</sub> retrievals over snow-covered surfaces:

OMI 1<sup>st</sup> winter season: Dec 2004-Jan-Feb 2005



# OMNO2 V4.0 Data for Trends and Emissions: Eastern US



## Status and next steps:

- Data re-processing nearly completed and evaluation on-going.
- Public release of the new OMNO2 V4.0 product is expected in October (after archiving at GES DISC and initial quality check).
- Adapting OMNO2 to GOME, SCIA, GOME-2: MEaSURES–NO<sub>2</sub> [PI. Lok Lamsal]
- Explicit aerosol corrections of tropospheric NO<sub>2</sub> columns (see poster by Alexander Vasilkov et al.)
- Improved resolution (25 km) *a-priori* NO<sub>2</sub> profiles
- Quantitative comparisons with S5P/TROPOMI data in progress
- **Advanced OMI NO<sub>2</sub> data analysis:**
  - Partition between free-tropospheric and PBL NO<sub>2</sub> columns (cloud slicing)
  - Compare regional seasonal NO<sub>2</sub> trends for snow-free and snow (no clouds) conditions.
- Update OMI seasonal NO<sub>x</sub> emissions for point sources
  - Compare emissions for snow and snow-free conditions
- Merge OMI and TROPOMI NO<sub>2</sub> columns and NO<sub>x</sub> emissions timeseries
- Compare with GEO GEMS (2020-) and TEMPO (2022-) NO<sub>2</sub> retrievals